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DEVICE AT DISTILLERS ADAPTED TO DISTIL SOLVENTS FOR
RECOVERY OF PURE SOLVENT FROM IMPURE SOLVENT.

The present invention relates to a device at distillers adapted to distil solvents for recovery of pure solvent from impure solvent, said solvent being used e.g. for washing away residues of paint from spray guns, wherein the distiller comprises an outer container with a boiling chamber which at the top has an opening which can be tightly closed by means of a cover, wherein a flexible inner container is provided in the boiling chamber, said flexible inner container containing impure solvent to be distilled, and wherein a heating device is provided to heat the impure solvent in the flexible inner container such that it is boiled and solvent steam thereby is generated in an upper space of the boiling chamber, said solvent steam flowing out from said upper space through at least one outlet and into a condensing device which is provided to condense the solvent steam to pure solvent.

At distillers of the abovementioned type, experience shows that solvent might accumulate in the boiling chamber beneath the flexible inner container. During heating and boiling of the solvent in the flexible inner container, said solvent is heated and boiled also beneath said flexible inner container. The solvent steam generated beneath the flexible inner container when the solvent beneath it is brought to boil, might under unfortunate circumstances be prevented by the flexible inner container from flowing up into the upper space of the boiling chamber and out through the outlet therefrom to the condensing device. Hereby, there is a risk that the solvent steam beneath the flexible inner container lifts said flexible inner container such that it obstructs the outlet from the upper space of the boiling chamber to the condensing device. Furthermore, the flexible inner container might be pressed out between upper parts of the distiller and its cover. It has been noticed that this might lead to that hot solvent is pressed out from the boiling chamber at the top thereof and spread around the distiller, with the risk for extensive damages as a result, which of course is unacceptable.

The object of the present invention is to eliminate this danger by simple means and this is accomplished by providing the device with substantially the characterizing features of subsequent claim 1.

Since the device has been given said characterizing features, it is achieved that solvent steam generated beneath the flexible inner container is fed past said flexible inner container at its side to the upper space of the boiling chamber and out through the outlet to the condensing device. Thus, the risk for said solvent steam lifting the flexible inner container is eliminated and thereby, the risk for solvent being pressed out at the top of the boiling chamber.

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 The invention will be further described below with reference to the accompanying drawings, in which

fig. 1 is a side view of a distiller and a condensing device connected thereto;

fig. 2 is a schematic sectional view of a distiller of prior art type;

fig. 3 is a schematic sectional view of a distiller of prior art type having a flexible inner container in a raised, unacceptable condition;

fig. 4 is a schematic sectional view of a distiller with a device according to the invention;

fig. 5 is a section V-V through a part of the distiller of fig. 4;

fig. 6 is a schematic sectional view of a distiller having an alternative embodiment of the device according to the invention; and

fig. 7 is a section VII-VII through a part of the distiller of fig. 6.

The drawing figures illustrate a distiller 1 for distilling a solvent 2 in order to recover pure solvent from impure solvent. The distiller 1 may preferably be used for distilling a solvent 2, e.g. paint thinner, which has been used for washing away residues of paint from spray guns (not shown) in a washing device 3 provided therefor and illustrated with broken lines in fig. 1. Such a washing device 3 may be connected to the distiller 1 through a conduit 4 which feeds impure solvent 2 into the distiller 1, said feeding being marked with an arrow A. Alternatively, impure solvent 2 from the washing device 3 or any other

device can be poured into the distiller 1, which in fig. 1 is marked with an arrow B.

The distiller 1 comprises an outer container 5 with a heating device 6 which is adapted to heat impure solvent 2 in the distiller 1 such that it is brought to boil and such that solvent steam 7 is thereby generated. The outer container 5 of the distiller 1 includes a boiling chamber 8 with an opening 9 at the top. The opening 9 can be tightly sealed by means of a cover 10 which in closing position, through a sealing means 11, engages an upper edge 12 of the outer container 5.

The cover 10 is sealed such that it intentionally lightens and releases steam if a certain predetermined pressure is exceeded in the boiling chamber 8.

Inside the boiling chamber 8 there is provided a flexible inner container 13 of plastic material or any other suitable material. The flexible inner container 13 is at the top fastened to the inner walls 14 of the outer container 5 by means of a retaining ring 15. This ring is located within upper parts of the flexible inner container 13 and clamps said upper parts against the inner walls 14.

Impure solvent 2 is fed to the flexible inner container 13 either through the conduit 4 or through the opening 9 and boiled through heating to generate the solvent steam 7 in an upper space 16 of the boiling chamber 8. This solvent steam 7 is fed through at least one outlet 17 to a condensing device 18, in which they are condensed to liquid solvent. The direction of flow of the solvent steam 7 through and out of the upper space 16, is illustrated with arrows C in figs. 2, 4 and 6.

Experience shows that a certain amount of solvent 2a accumulates in a lower space 19 in the boiling chamber 8

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and this solvent 2a is also brought to boil and thereby emit solvent steam 7a. Since the flexible inner container 13 under unfortunate circumstances might obstruct the path for the solvent steam 7a and prevent it from flowing up into the upper space 16 and out through the outlet 17, the solvent steam 7a flowing upwards might lift the flexible inner container 13, which is illustrated with arrows D in fig. 3.

Since this is unacceptable, at least one pipe means 20 or a corresponding member is located in the boiling chamber 8 or adjacent said boiling chamber and beside the flexible inner container 13 in order to allow solvent steam 7a to pass from the lower space 19 to the upper space 16 and therefrom out through the outlet 17, whereby said solvent steam 7a is prevented from lifting the flexible inner container 13 in the boiling chamber 8. Thus, the solvent steam 7a flows into the pipe means 20 down below (arrow E) and out of the pipe means 20 at the top thereof (arrow F) and into the upper space 16.

As is apparent from fig. 5, the retaining ring 15 preferably comprises an inwardly bent part such that it makes room for said pipe means 20.

As is shown in fig. 6, the pipe means 20 may comprise a part 22 having a V-profile and holes 23. Said part 22 can be attached to portions 24 of the inner walls 14 and together therewith define the pipe means 20. Said part 22 may run the entire way from the bottom of the boiling chamber 8 to the top thereof and it may consist of stainless material and be punched.

As is illustrated in fig. 7, the retaining ring 15 may include an inwardly directed part 25 which is designed to make room for the pipe means 20 shown in fig. 6.

The invention described above may vary within the scope of the subsequent claims regarding its construction and function. It should be mentioned that said solvent does not need to be used for washing spray guns, but may be used for washing quite different objects.